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FRASER CLEMENS MARTIN & MILLER LLC
28366 KENSINGTON LANE
PERRYSBURG, OH 43551

EXAMINER	
GUILL, RUSSELL L	

ART UNIT	PAPER NUMBER
2123	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

miller@fraser-ip.com
sloan@fraser-ip.com
crooks@fraser-ip.com

Office Action Summary	Application No.	Applicant(s)	
	10/540,427	CHANG ET AL.	
	Examiner	Art Unit	
	Russ Guill	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/22/2005,9/24/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 - 22 have been examined. Claims 1 - 22 have been rejected.

2. As an initial issue, please note that claims 8 - 14 are not examined relative to prior art due to rejections under 35 USC § 112, second paragraph, as described below. However, references that may be used to reject the claims are provided in the Conclusions section of this Office Action.

Specification

3. The specification is objected to for the following minor informalities: The specification recites on page 7, lines 19 - 20, "exposure of the preform to each respective lamp **a** respective step". The phrase appears to have a minor grammatical error.

Claim Objections

4. Claim 22 is objected to for the following minor issue: the claim recites in line 29, "determining a bottle wall thickness". The phrase may be intended to be, "determining a bottle wall thickness **profile**". The Applicant is respectfully asked to ensure that the limitation is correct.

5. Claim 20 is objected to for the following minor informality: The claim is objected to for the same reason as claim 22 above.

6. Claim 10 is objected to for the following minor informalities: the claim recites, "A_p is an area said perform". The phrase appears to mean, "A_p is an area **of** said perform". Further, the claim recites, "φ is an angle between normal to a perform surface". The phrase appears to mean, "φ is an angle between **a** normal to a perform surface".

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

a. Claims 8 - 14, 17 - 21 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

i. Regarding claim 8 and dependent claims 9 - 14, claim 8 recites, "determining an absorption radiation of said preforms". The term, "absorption radiation" does not appear to be defined in the specification. A reasonable claim interpretation would require considerable speculation regarding the meaning of terms in the claim and the scope of the claim, and therefore, a claim interpretation is not being made. **Therefore, claim 8 and dependent claims will not be examined relative to the prior art.**

ii. Regarding claim 10, the claim recites, "r is a distance between normal surface A_p and A_h". The meaning of the a normal surface A_p is unclear.

iii. Regarding claim 11, the claim recites, "said radiation spectra transmitted through a respective block of said preform is provided". While radiation spectra has antecedent basis, the radiation spectra does not appear to be transmitted through a respective block. Further, radiation *spectra* does not appear capable of being transmitted; rather, the specification appears to recite that radiation is transmitted. Further, the claim recites, "determining said absorption radiation incident to a next adjacent block". The claim appears to be related to the portion of the specification that recites, "Also, radiation transmitted through a respective discretized block is used in calculating the energy incident and absorbed

in a next adjacent discretized block". A reasonable claim interpretation would require considerable speculation regarding the meaning of terms in the claim and the scope of the claim, and therefore, a claim interpretation is not being made. Therefore, claim 11 and dependent claims will not be examined relative to the prior art.

iv. Regarding claim 12, the claim recites, "said step of providing a stress/strain behavior". The phrase appears to have insufficient antecedent support. For the purpose of claim examination, the claim is interpreted as, "The method of claim **11** wherein said step of providing a stress/strain behavior further comprises discretizing said preform into a plurality of sections".

v. Regarding claim 17 and dependent claims, claim 17 recites in lines 11 and 16, "temperature heating sources". The meaning of the phrase cannot be determined. For the purpose of claim examination, the phrase is interpreted as, "temperature **of** heating sources".

vi. Regarding claim 22, the claim recites in line 13, "temperature heating sources". The meaning of the phrase cannot be determined. For the purpose of claim examination, the phrase is interpreted as, "temperature **of** heating sources".

vii. Regarding claim 22, the claim recites in line 18, "temperature heating source". The meaning of the phrase cannot be determined. For the purpose of claim examination, the phrase is interpreted as, "temperature **of** heating source**s**".

viii. Regarding claim 22, the claim recites in line 19, "spectra of a material". It is unclear what the spectra of a material means. For the purpose of claim examination, the phrase is interpreted as, "**absorption** spectra of a material".

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. **Claims 1, 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeve (Hayden M. Reeve et al., "Experimental and Numerical Investigation of Polymer Preform Heating", April 2001, Journal of Materials Processing & Manufacturing Science, Volume 9, pages 285 - 301) in view of Turner (Travis L. Turner et al., "Numerical and Experimental Analyses of the Radiant Heat Flux Produced by Quartz Heating Systems", March 1994, NASA Technical Paper 3387, pages 1 - 37).

a. The art of Reeve is directed to experimental and numerical investigation of polymer preform heating (*title*).

b. The art of Turner is directed to analyses of radiant heat flux produced by quartz heating systems (*title*).

c. The art of Turner and the art of Reeve are analogous art because they both pertain to the art of thermal radiation heat transfer. Further, the ordinary artisan would have known that quartz heaters were used in preform heating (*see U.S. Patent 4,407,651, column 1, lines 34 - 36*).

d. The motivation to use the art of Turner with the art of Reeve would have been the benefit recited in Turner that a method is developed for predicting the radiant heat flux distribution produced by quartz envelope heating systems (*page 1, section "Summary", first paragraph*), which would have been recognized as a benefit by the ordinary artisan because the ordinary artisan would have known that quartz heating systems were used in preform heating (*see U.S. Patent 4,407,651, column 1, lines 34 - 36*).

e. Regarding **claims 1, 17**:

f. Reeve appears to teach:

g. A method for simulating the heating of a plastic preform (*page 285, title, and abstract*).

h. inputting a preform geometry into a preform design program (*page 289, section labeled "Model", first paragraph, "The numerical domain is comprised of the furnace cavity and the polymer preform", and page 288, figure 2*);

i. providing oven geometry and calculating spatial location of said preform through at least one oven (*page 289, section labeled "Model", first paragraph, "The numerical domain is comprised of the furnace cavity and the polymer preform", and page 288, figure 2; it would have been obvious to calculate the spatial location of a preform through an oven, for example, see U.S. patent 4,407,651, column 1, lines 15 - 18, and U.S. patent 5,607,706, column 6, lines 8 - 15, both patents disclose a preform moving through an oven*);

j. providing heating information (*page 289, section labeled "Model", third paragraph, "The furnace wall temperature profile and iris temperatures were prescribed . . ."*) ~~and calculating temperatures of primary and secondary heating sources~~;

k. solving energy equations based upon said preform geometry, said spatial location of said preform, said temperatures, cooling air and absorption spectra of a material of said preform (*pages 290 - 291, section labeled "Governing Equations", especially equation 4, the energy equation;and page 289, section labeled "Model")*; and

l. computing at least one cross sectional thermal profile of a final heated preform (*page 293, figure 4, section (c), please note the temperature profile of the preform; and pages 293 - 294, section labeled "Predicted Heat and Flow Patterns"*).

m. Reeve does not specifically teach:

n. ~~providing heating information and~~ calculating temperatures of primary and secondary heating sources;

o. Turner appears to teach:

p. ~~providing heating information and~~ calculating temperatures of primary and secondary heating sources (*page 11, right-side column, starting at the second paragraph that starts with, "A filament has a radiative power . . ."; and pages 2 - 3, section labeled "Scope of the Present Study"*);

q. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Turner with the art of Reeve to produce the claimed invention.

11. **Claims 2 - 7 and 18 - 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeve as modified by Turner as applied to claims 1 and 17 above, further in view

of McEvoy (J.P. McEvoy et al., "Simulation of the Stretch Blow Molding Process of PET Bottles", 1998, Advances in Polymer Technology, volume 17, number 4, pages 339 - 352).

a. Reeve as modified by Turner teaches a method for simulating the heating of a plastic perform as recited in claims 1 and 17 above.

b. The art of McEvoy is directed to simulation of the blow molding process of PET bottles (*page 339, title*).

c. The art of McEvoy and the art of Reeve as modified by Turner are analogous art because they both pertain to the art of preform heating (*McEvoy, page 340, figures 1 and 2, and left-side column, second paragraph, and right-side column, first paragraph*).

d. The motivation to use the art of McEvoy with the art of Reeve as modified by Turner would have been the benefit recited in McEvoy that a simulation was successfully carried out to evaluate the optimum process conditions for a given preform and bottle (*page 351, section labeled "Conclusions", last sentence*), which would have been recognized as a benefit by the ordinary artisan.

e. Regarding **claim 2**:

f. Reeve does not specifically teach:

g. `providing a stress/strain behavior of said material and simulating stretch blow molding of said heated preform;`

h. McEvoy appears to teach:

i. `providing a stress/strain behavior of said material and simulating stretch blow molding of said heated preform (page 343 - 344, section labeled "Material Model", it would have been obvious that an elastic model included stress/strain behavior; and page 339, title);`

j. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Turner and the art of McEvoy with the art of Reeve to produce the claimed invention.

k. Regarding **claim 3**:

l. Reeve does not specifically teach:

m. generating a bottle geometry for a bottle design;

n. McEvoy appears to teach:

o. generating a bottle geometry for a bottle design (*page 340, figure 1, right-most two figures show a bottle geometry; it would have been obvious that simulation of blow molding of bottles needed a bottle geometry*);

p. Regarding **claim 4**:

q. Reeve does not specifically teach:

r. determining a bottle wall thickness profile;

s. McEvoy appears to teach:

t. determining a bottle wall thickness profile (*page 339, abstract, "the predicted bottle wall thickness distribution . . ."; and page 351, figure 32*).

u. Regarding **claim 5**:

v. Reeve does not specifically teach:

w. performing a design optimization routine;

x. Official Notice is taken that it was old and well known in the art to perform a design optimization routine for optimizing a design. It would have been obvious to the ordinary artisan at the time of invention to perform a design optimization routine with the art of Reeve, Turner and McEvoy to optimize a design of a preform. The motivation would have been the knowledge of the ordinary artisan

that optimizing a design saves money. Please refer to U.S. Patent Number 6,725,112 (*figure 2, element 22*) and U.S. Patent Number 6,973,389 (*figure 1, element 30*) for examples of optimization modules.

y. Regarding **claim 6**:

z. Reeve does not specifically teach:

aa. Incorporating the geometry of an existing preform to determine its fitness for use in a specific application;

bb. McEvoy appears to teach:

cc. Incorporating the geometry of an existing preform to determine its fitness for use in a specific application (*page 340, figure 2 displays an existing preform*);

dd. Regarding **claim 7**:

ee. Reeve does not specifically teach:

ff. determining an emission spectra of said primary and secondary heating sources.

gg. Turner appears to teach:

hh. determining an emission spectra of said primary and secondary heating sources (*page 12, section "Source Spectral Distributions"*).

ii. Regarding **claim 18**:

jj. Reeve does not specifically teach:

kk. providing a stress/strain behavior of said material as a function of said temperatures derived in said perform heating module and simulating stretch blow molding of said heated preform;

ll. McEvoy appears to teach:

mm. providing a stress/strain behavior of said material as a function of said temperatures derived in said preform heating module and simulating stretch blow molding of said heated preform (*page 343 - 344,*

section labeled "Material Model", especially "To accurately model the mechanical properties of PET, . . . temperature dependence and strain history should be taken into account"; it would have been obvious that an elastic model included stress/strain behavior);

nn. Regarding **claim 19**:

oo. Reeve does not specifically teach:

pp. Means for generating a bottle geometry for a bottle design;

qq. McEvoy appears to teach:

rr. Means for generating a bottle geometry for a bottle design *(page 340, figure 1, right-most two figures show a bottle geometry; it would have been obvious that simulation of blow molding of bottles needed a bottle geometry);*

ss. Regarding **claim 20**:

tt. Reeve does not specifically teach:

uu. determining a bottle wall thickness;

vv. McEvoy appears to teach:

ww. determining a bottle wall thickness *(page 339, abstract, "the predicted bottle wall thickness distribution . . ."; and page 351, figure 32).*

xx. Regarding **claim 21**:

yy. McEvoy appears to teach:

zz. ~~a design optimization module for~~ optimizing a material distribution efficiency of said preform *(page 340, right-side column, first sentence, "Generally, preform design is optimized by trial and error; however the development of computer techniques has provided a shift toward a more scientific design approach.", and page 339, Abstract, "predicted wall thickness distribution");*

aaa. Official Notice is taken that it was old and well known in the art to have a design optimization module for optimizing a design. It would have been obvious to the ordinary artisan at the time of invention to use a design optimization module for optimizing a design with the art of Reeve, Turner and McEvoy to optimize a material distribution efficiency of a preform. The motivation would have been the knowledge of the ordinary artisan that optimizing a design saves money. Please refer to U.S. Patent Number 6,725,112 (*figure 2, element 22*) and U.S. Patent Number 6,973,389 (*figure 1, element 30*) for examples of optimization modules.

12. **Claims 15, 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Reeve (Hayden M. Reeve et al., "Experimental and Numerical Investigation of Polymer Preform Heating", April 2001, Journal of Materials Processing & Manufacturing Science, Volume 9, pages 285 - 301) in view of Turner (Travis L. Turner et al., "Numerical and Experimental Analyses of the Radiant Heat Flux Produced by Quartz Heating Systems", March 1994, NASA Technical Paper 3387, pages 1 - 37), further in view of McEvoy (J.P. McEvoy et al., "Simulation of the Stretch Blow Molding Process of PET Bottles", 1998, Advances in Polymer Technology, volume 17, number 4, pages 339 - 352).

a. The art of Reeve is directed to experimental and numerical investigation of polymer preform heating (*title*).

b. The art of Turner is directed to analyses of radiant heat flux produced by quartz heating systems (*title*).

c. The art of McEvoy is directed to simulation of the blow molding process of PET bottles (*page 339, title*).

d. The art of Turner and the art of Reeve are analogous art because they both pertain to the art of thermal radiation heat transfer. Further, the ordinary artisan would have known that quartz heaters were used in preform heating (*see U.S. Patent 4,407,651, column 1, lines 34 - 36*).

e. The art of McEvoy and the art of Reeve are analogous art because they both pertain to the art of preform heating (*McEvoy, page 340, figures 1 and 2, and left-side column, second paragraph, and right-side column, first paragraph*).

f. The motivation to use the art of Turner with the art of Reeve would have been the benefit recited in Turner that a method is developed for predicting the radiant heat flux distribution produced by quartz envelope heating systems (*page 1, section "Summary", first paragraph*), which would have been recognized as a benefit by the ordinary artisan because the ordinary artisan would have known that quartz heating systems were used in preform heating (*see U.S. Patent 4,407,651, column 1, lines 34 - 36*).

g. The motivation to use the art of McEvoy with the art of Reeve would have been the benefit recited in McEvoy that a simulation was successfully carried out to evaluate the optimum process conditions for a given preform and bottle (*page 351, section labeled "Conclusions", last sentence*), which would have been recognized as a benefit by the ordinary artisan.

h. Regarding **claim 15**:

i. Reeve appears to teach:

j. inputting a preform geometry into a preform design program (*page 289, section labeled "Model", first paragraph, "The numerical domain is comprised of the furnace cavity and the polymer preform", and page 288, figure 2*);

k. providing oven geometry and calculating spatial location of said preform through at least one oven (*page 289, section labeled "Model", first paragraph, "The numerical domain is comprised of the furnace*

cavity and the polymer preform", and page 288, figure 2; it would have been obvious to calculate the spatial location of a preform through an oven, for example, see U.S. patent 4,407,651, column 1, lines 15 - 18, and U.S. patent 5,607,706, column 6, lines 8 - 15, both patents disclose a preform moving through an oven);

l. providing heating information (*page 289, section labeled "Model", third paragraph, "The furnace wall temperature profile and iris temperatures were prescribed . . ."*) ~~and calculating temperatures of primary and secondary heating sources~~;

m. solving energy equations based upon said preform geometry, said spatial location of said preform, said temperatures, cooling air and absorption spectra of a material of said preform (*pages 290 - 291, section labeled "Governing Equations", especially equation 4, the energy equation;and page 289, section labeled "Model");* and

n. computing at least one cross sectional thermal profile of a final heated preform (*page 293, figure 4, section (c), please note the temperature profile of the preform; and pages 293 - 294, section labeled "Predicted Heat and Flow Patterns"*).

o. Reeve does not specifically teach:

p. A method for the virtual prototyping of plastic containers;

q. generating a bottle geometry for a bottle design;

r. ~~providing heating information and~~ calculating temperatures of primary and secondary heating sources;

s. providing a stress/strain behavior of said material and simulating stretch blow molding of said heated preform; and

t. determining a bottle wall thickness profile.

u. Turner appears to teach:

v. ~~providing heating information and~~ calculating temperatures of primary and secondary heating sources (*page 11, right-side column, starting at the second paragraph that starts with, "A filament has a*

radiative power . . ."; and pages 2 - 3, section labeled "Scope of the Present Study");

w. McEvoy appears to teach:

x. A method for the virtual prototyping of plastic containers (*page 339, title*);

y. generating a bottle geometry for a bottle design (*page 340, figure 1, right-most two figures show a bottle geometry; it would have been obvious that simulation of blow molding of bottles needed a bottle geometry*);

z. providing a stress/strain behavior of said material and simulating stretch blow molding of said heated preform (*page 343 - 344, section labeled "Material Model", it would have been obvious that an elastic model included stress/strain behavior; and page 339, title*);

aa. determining a bottle wall thickness profile (*page 339, abstract, "the predicted bottle wall thickness distribution . . ."; and page 351, figure 32*).

bb. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Turner and the art of McEvoy with the art of Reeve to produce the claimed invention.

cc. Regarding **claim 16**:

dd. The rejection of claim 15 above teaches most of claim 16 also. The differences are taught below.

ee. Reeve does not specifically teach:

ff. Generating a preform design for said bottle by means of a preform design program;

gg. McEvoy appears to teach:

hh. Generating a preform design for said bottle by means of a preform design program (*pages 342 - 342, section labeled "ABAQUS Model" and figures 11 and 12; it would have been obvious that ABAQUS was used to design a preform. Further, the prior art of the Applicant admits that*

U.S. Patent 6,116,888 teaches utilizing a CAD software to design a bottle, and it would have been obvious to use the CAD software to design the preform also);

ii. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Turner and the art of McEvoy with the art of Reeve to produce the claimed invention.

13. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Reeve (Hayden M. Reeve et al., "Experimental and Numerical Investigation of Polymer Preform Heating", April 2001, Journal of Materials Processing & Manufacturing Science, Volume 9, pages 285 - 301) in view of Turner (Travis L. Turner et al., "Numerical and Experimental Analyses of the Radiant Heat Flux Produced by Quartz Heating Systems", March 1994, NASA Technical Paper 3387, pages 1 - 37), further in view of McEvoy (J.P. McEvoy et al., "Simulation of the Stretch Blow Molding Process of PET Bottles", 1998, Advances in Polymer Technology, volume 17, number 4, pages 339 - 352).

a. The art of Reeve is directed to experimental and numerical investigation of polymer preform heating (*title*).

b. The art of Turner is directed to analyses of radiant heat flux produced by quartz heating systems (*title*).

c. The art of McEvoy is directed to simulation of the blow molding process of PET bottles (*page 339, title*).

d. The art of Turner and the art of Reeve are analogous art because they both pertain to the art of thermal radiation heat transfer. Further, the ordinary artisan would have known that quartz heaters were used in preform heating (*see U.S. Patent 4,407,651, column 1, lines 34 - 36*).

e. The art of McEvoy and the art of Reeve are analogous art because they both pertain to the art of preform heating (*McEvoy, page 340, figures 1 and 2, and left-side column, second paragraph, and right-side column, first paragraph*).

f. The motivation to use the art of Turner with the art of Reeve would have been the benefit recited in Turner that a method is developed for predicting the radiant heat flux distribution produced by quartz envelope heating systems (*page 1, section "Summary", first paragraph*), which would have been recognized as a benefit by the ordinary artisan because the ordinary artisan would have known that quartz heating systems were used in preform heating (*see U.S. Patent 4,407,651, column 1, lines 34 – 36*).

g. The motivation to use the art of McEvoy with the art of Reeve would have been the benefit recited in McEvoy that a simulation was successfully carried out to evaluate the optimum process conditions for a given preform and bottle (*page 351, section labeled "Conclusions", last sentence*), which would have been recognized as a benefit by the ordinary artisan.

h. Regarding **claim 22**:

i. Claim 15 above teaches most of the limitations of claim 22. The differences are taught below.

j. Reeve does not specifically teach:

k. determining a stress/strain behavior of said material as a function of said temperatures derived in said preform heating module;

l. a design optimization module for optimizing a material distribution efficiency of said preform.

m. McEvoy appears to teach:

n. providing a stress/strain behavior of said material as a function of said temperatures derived in said preform heating module (*page 343 - 344, section labeled "Material Model", especially "To accurately model the mechanical properties of PET, . . . temperature dependence and strain history should be taken into account"; it would have been obvious that an elastic model included stress/strain behavior*);

o. ~~a design optimization module for~~ optimizing a material distribution efficiency of said preform (*page 340, right-side column, first sentence, "Generally, preform design is optimized by trial and error; however the development of computer techniques has provided a shift toward a more scientific design approach.", and page 339, Abstract, "predicted wall thickness distribution"*);

p. Official Notice is taken that it was old and well known in the art to have a design optimization module for optimizing a design. It would have been obvious to the ordinary artisan at the time of invention to use a design optimization module for optimizing a design with the art of Reeve, Turner and McEvoy to optimize a material distribution efficiency of a preform. The motivation would have been the knowledge of the ordinary artisan that optimizing a design saves money. Please refer to U.S. Patent Number 6,725,112 (*figure 2, element 22*) and U.S. Patent Number 6,973,389 (*figure 1, element 30*) for examples of optimization modules.

q. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Turner and the art of McEvoy with the art of Reeve to produce the claimed invention.

14. **Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although

the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the Applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. The entire reference is considered to provide disclosure relating to the claimed invention.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure:

a. Robert Siegel and John R. Howell, "Thermal Radiation Heat Transfer", 2002, Taylor & Francis, pages 35 - 63, 155 - 192, 207 - 248, 267 - 286, 295 - 325, 335 - 357, 371 - 406, 419 - 429; teaches knowledge of the ordinary artisan regarding radiation heat transfer (claims 8 - 12), including heat transfer using absorption spectra of materials, and convection.

b. P.G. Llana et al., "Finite strain behavior of poly(ethylene terephthalate) above the glass transition temperature", 1999, Polymer, pages 6729 - 6751; teaches knowledge of the ordinary artisan regarding temperature dependence of stress/strain in PET.

c. M.C. Boyce et al., "Constitutive model for the finite deformation stress-strain behavior of poly(ethylene terephthalate) above the glass transition temperature", 2000, Polymer, pages 2183 - 2201; teaches knowledge of the ordinary artisan regarding temperature dependence of stress/strain in PET.

d. G. Venkateswaran et al., "Effects of Temperature Profiles through Preform Thickness on the Properties of Reheat-Blown PET Containers", 1998, Advances in

Polymer Technology, Volume 17, Number 3, pages 237 - 249; teaches knowledge of the ordinary artisan, especially hoop and axial orientations (claims 13 and 14).

e. Ph. Lebaudy et al., "Heating Simulation of Multilayer Preforms", 2001, Journal of Applied Polymer Science, Volume 80, pages 2683 - 2689; teaches knowledge of the ordinary artisan including spectral absorption characteristics of a preform.

f. Kevin Sandieson et al., "Case study of simulation software in the production design phase", 2001, ANTEC 2001 Conference Proceedings, Volume 3, two unnumbered pages; teaches perform design using software.

g. U.S. Patent 4,407,651 teaches quartz heating systems were used in preform heating, and a preform moving through an oven.

h. U.S. patent 5,607,706 teaches a preform moving through an oven.

i. U.S. patent 6,116,888 teaches utilizing a CAD software to design a bottle.

j. U.S. Patent 6,725,112 teaches an optimization module.

k. U.S. Patent 6,973,389 teaches an optimization module.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russ Guill whose telephone number is 571-272-7955. The examiner can normally be reached on Monday - Friday 9:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Russ Guill
Examiner
Art Unit 2123

RG

PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100